

In re Patent Application of:

AMMAR

Serial No. **09/862,982**

Filing Date: **May 22, 2001**

REMARKS

Claims 1-15 remain in this application. Claims 16-20 have been previously cancelled. Claims 1 and 10 are amended.

Applicant has amended the claims to stress the MMIC chip having pads that are directly exposed through openings of the chip cover for wire and ribbon bonding on an exterior circuit board without interconnects attached to the pads on the MMIC. The confusing language regarding intermediate leads has been cancelled and the use of the words "without interconnects attached to the pads on the MMIC" has been substituted. This substituted language was also used in the divisional patent application serial no. 10/368,075, allowed on December 16, 2003. The issue fee has been paid on that divisional application. No new matter is added and the drawings in FIG. 2A and FIG. 2B show the exposed pads 50 for direct bonding as explained in the detailed description. An exterior circuit board is not positively claimed, but MMIC chips are shown on boards in other figures in any event.

Applicant also submits other prior art located in the divisional application by the Examiner.

At the outset, Applicant notes that the amended claims as now presented recite a single MMIC chip having one or more pads that are placed on a soldered perform. The chip cover has openings and is positioned over the MMIC to cover the chip and form a MMIC package that can be automatically picked and placed. The base plate and cover are configured with respective portions that engage each other such that any pads on the MMIC are directly exposed through openings of the

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chip cover for wire and ribbon bonding on an exterior circuit board without interconnects attached to the pads on the MMIC.

As noted before, this is shown in the drawings and explained in the detailed description on page 12 at line 27, as shown in FIGS. 2A and 2B, to form open areas at the top and side of the corners and to "leave exposed any pads 50 on the MMIC for wire and ribbon bonding thereto." The MMIC package can be picked and placed directly on an exterior circuit board such that the exposed pads can be wire or ribbon bond without the interconnects attached to the pads on the MMIC.

The present invention is an improvement over the cited prior art, most notably, the primary references to Ziegner and Koizumi used by the Examiner in the obviousness rejection, which required four (4) separate references to be sustained by the Examiner. Applicant notes that Ziegner specifically teaches away from the present claimed invention. In Ziegner, there is no direct exposing of any MMIC or other IC pads. Instead, Ziegner uses an intermediate connector 26, which attaches to other pads, which in turn are connected to other connections. Thus the pair of interconnects 26 is an intermediate connector and no pads are exposed directly for wire and ribbon bonding, as in the present claimed invention. This is clearly reflected in Ziegner at column 3, lines 13-25, which recites:

"As shown in FIGS. 1-3, the package 20 which is in accordance with a preferred embodiment of the present invention includes a base 22, a cover 24, a pair of interconnects 26, and a spring clip 28. When the base 22 and the cover 24 are engaged with each other, as illustrated in FIGS. 1 and 3, they form a housing, and within the

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housing is an integrated circuit 30, as shown in FIGS. 2 and 5, such as a millimeter wave circuit 32 mounted on a glass substrate 34.

Specifically, the integrated circuit 30 is mounted on the base 22, within the housing formed by the base 22 and the cover 24.

Therefore, the package 20 can be said to consist of a base 22, an integrated circuit 30, a pair of interconnects 26, a cover 24 and a spring clip 28."

The same argument applies to Koizumi, in which inner leads 25 are joined to leads by thermocompression bonding and formed on a tape carrier. Outer leads 26 are included. It is clear as shown by the drawings that Koizumi teaches the use of intermediate contacts and no pads are directly exposed for wire and ribbon bonding to an exterior board as in the present claimed invention.

Goto uses a waveguide as a connection. Goto is directed to solving a much different problem than the present claimed invention. This is clearly shown in the different figures with the waveguide positioned adjacent terminals. There is no teaching or suggestion in Goto for exposing a MMIC pad for wire and ribbon bonding without interconnects and the other details as set forth in the present Amendment. There is no disclosure or even suggestion for exposing MMIC pads for wire and ribbon bonding.

As to Martin, it is specifically directed to covers for micromechanical sensors as a chip bonded to a circuit board 70.

It is clear, then, that the present claimed invention is patentable over the four cited references used to

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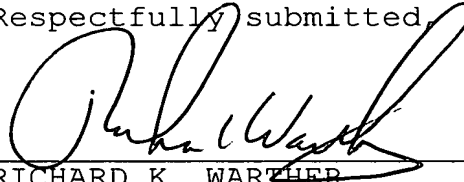
reject claims 1-3 and 6-15 because Ziegner and Koizumi teach away from the present claimed invention.

As to the other cited references to Harris and Hayakawa, Applicant notes that Hayakawa et al. specifically discloses intermediate connections and is limited to a semiconductor device that amplifies microwave signals. There could be no direct wire and ribbon bonding to exposed pads of a MMIC. Harris teaches a plastic cover, but still uses intermediate circuit connectors, similar to Hayakawa et al.

Applicant contends that the present case is in condition for allowance and respectfully requests that the Examiner issue a Notice of Allowance and Issue Fee Due.

If the Examiner has any questions or suggestions for placing this case in condition for allowance, the undersigned attorney would appreciate a telephone call.

Respectfully submitted,



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mail in an envelope addressed to: **MAIL STOP FEE AMENDMENT,**
COMMISSIONER FOR PATENTS, P.O. BOX 1450, ALEXANDRIA, VA
22313-1450, on this 10th day of March, 2004.

Julie Lalan